**Why do I need to know about SCIENCE?**

**What can Science do for me?**

**A WebQuest for Stage 4 Science**

Designed by

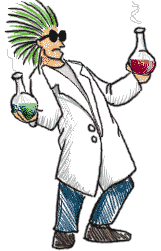
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**Introduction**

So here you are sitting (maybe for the first time) in a school science laboratory. It’s different to all of your other classrooms, and there is lots of funny looking equipment all over the place. So what is Science anyway, and why is it important that you do Science at school?



Hopefully, when you have completed this task you will have a better understanding of Science and the important role that it plays in addressing issues for our society.

However, before you can understand how Science can be applied to a specific problem you need to find out what Science really is.

**Tasks**

*“Science is always wrong. It never solves a problem without creating ten more”.*

*(George Bernard Shaw)*

*But scientists, who ought to know,   
Assure us that it must be so.   
Oh, let us never, never doubt   
What nobody is sure about.* Hilaire Belloc

1. The word "science" means "knowledge." It comes from the Latin word, "scire," "to know." A starting definition of "science," then, is human knowledge.

The story, of course, is not so simple. These two terms are both difficult if not impossible to define. For example;

* What makes knowledge? Is an opinion, knowledge?
* Is a belief, knowledge?
* What is the difference between a belief and a piece of knowledge?
* Why is a physics course, called a science, ("knowledge") but a literature course isn't. Is there no knowledge in literature?

In this preliminary exercise you will work with two other students to discover the ‘essence’ of Science



1. Good science can solve big problems and although there are many issues facing society today, climate change is receiving a lot of publicity at the moment. Sir Richard Branson, who owns Virgin Airlines, has offered $25 million to the scientist, or team, who can come up with a way of extracting greenhouse gases from the atmosphere.

Sir Richard Branson , left, throws a globe into the air watched by former US Vice President Al Gore, right, at a presentation to announce the Virgin Earth Challenge, in London, Friday Feb. 9, 2007. [AP]

Your task is to put together a team of three scientists who will be able to solve this problem. You need to select three scientists (living or dead) …….. you will need a **great thinker, a great chemist and a great environmental scientist**. You are looking for the three most capable scientists, who have already achieved extraordinary status because of the impact their work has had on human society. Each of you will ‘become’ one of these scientists, record your achievements and with your two friends propose yourselves as “Team Greenhouse”.

**The Process**

Your teacher will select groups of three, who will work together throughout this activity. Sometimes you will work independently to gather and provide information for the group effort and at other times you will collaborate closely.

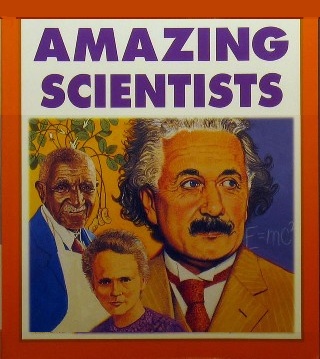
1. In this introductory part, your group should work together to find out what Science is and how it differs from other academic pursuits (like other subjects you do at School)

**The important questions you need to answer here are;**

* What is Science? Try to come up with a definition that your group can agree on.
* Is Science different from other academic areas? If so, how?
* Why do scientists do things differently than other people?

Here are some links to websites that may provide you with answers to these questions. *(Remember to make note of any references you use – you will need to add these to your bibliography later)*

|  |  |
| --- | --- |
| [What is Science? What is civilisation?](http://www.es.flinders.edu.au/~mattom/science+society/lectures/lecture1.html) | [What Science is](http://www.gly.uga.edu/railsback/1122science2.html) |
| [What is Science? What is civilisation?](http://www.es.flinders.edu.au/~mattom/science+society/lectures/lecture1.html) | [What Science isn’t](http://www.gly.uga.edu/railsback/1122science3.html) |
| [What is Science? Some famous people give their views.](http://www.chemistrycoach.com/what_is_science.htm) | [Mad Sci Network](http://www.madsci.org/posts/archives/feb98/887809688.Sh.r.html) |
| [What is Science? According to The Science Show](http://www.abc.net.au/rn/science/ss/stories/s320422.htm) |  |



Your answers to the preliminary questions;

* should be prepared using Microsoft Word.
* should be limited to one A4 page.
* should use 12-14pt font.
* should include some illustrations.
* should be checked for correct spelling.

Refer to the [evaluation](#Eval) sheet to ensure you understand how to gain maximum marks. Although you worked with your team, this report is your own work.

1. A good way to begin this part is by preparing a shortlist of potential candidates. To do this you will need access to the internet.

You are looking for three scientists who have, or had, excellent scientific method and great determination. They don’t necessarily need to be climatologists! So, make a start with these links

|  |  |
| --- | --- |
| [Inventions and inventors](http://www.suelebeau.com/inventions.htm) | [Famous scientists](http://www.crystalinks.com/scientists.html) |
| [Biographies](http://www.blupete.com/Literature/Biographies/Science/Scients.htm) | [Wikepedia](http://en.wikipedia.org/wiki/List_of_scientists) |

Each of you will choose one of these three scientists to explore further.

Having chosen your scientist who you consider fits the criteria **now imagine you are this person**. You will need to **prepare a resume** which outlines who you are and highlights your major scientific achievements.

These links will assist you with creating a resume:

|  |  |  |
| --- | --- | --- |
| [CareersOnline](http://www.careersonline.com.au/easyway/resume.html) | [Office templates](http://office.microsoft.com/en-us/templates/CT101043371033.aspx) | [Seek.com](http://www.seek.com.au/career-resources/get-your-dream-job/resume-guide.ascx) |
| [Kelly Scientific Resources](http://www.kellyscientific.com.au/web/au/ksr/en/pages/careers_system_requirements.html) | [Download a time limited Resume Builder](http://www.gold-software.com/download412.html) | |



You can adapt these forms to fit your needs. Fill in as much information as you can, and delete any parts that are not appropriate. Focus on the reasons why this person would be an essential team member for the research project – major successes, evidence of long term focus on the task, etc.

Remember that the resume is the only chance you have to impress the selection panel, so make sure it is going to attract their interest, and “sell” yourself.

To do this part well, make sure you have looked at the [evaluation](#Eval) rubric. It’s only your effort that is being assessed here.



Now you have to “sell” the scientific team to the selection panel. Together with the other two members of your group, you will build a PowerPoint that summarises ‘Team Greenhouse’.

Each of you should create 3 slides which show;

* A picture of your scientist
* A list of major achievements
* The expected role for this scientist in the team

You should all then collaborate on a final slide about the Team.

The maximum number of slides allowed is ten.

Look at the [evaluation](#Eval) rubric to see how the PowerPoint will be assessed. Remember, this is a team effort.

If selected (and you should assume that you will be) you will each be required to talk to your slides (not read from them) and present your scientific problem-solvers to the selection panel. This presentation will be limited to 4 minutes, because the selection panel is very busy. Prepare a script that includes information not covered by the PowerPoint slides, or that expands on it. The script will not be assessed, but you will need good notes for your talk, so prepare it well.

Here are some tips on making a good presentation:

* *Try using an everyday analogy or link what you say to common topics that the public can relate to.*
* *Don't worry about learning it so that you are word perfect, if you ad-lib it will come across as more natural and help your personality shine through.*
* *Don't cram too much into three minutes, but make sure there is some science in there.*
* *Try not to use jargon, but if you do explain what it means.*
* *Structure the talk with a beginning, middle and end. End on a high point that sums up and relates to earlier points.*
* *Make eye contact with the audience and smile!*

For this activity, you will be judged on your own presentation and that of your team, so make sure each of you knows who is saying what, and how you hand over to each other.

Again, check the [evaluation](#Eval) rubric to ensure you cover all the bases.

**Evaluation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Beginning (1) | Developing (2) | Accomplished (3) | Exemplary (4) | Score |
| Answers to preliminary questions – individual score | Provides a basic answer to each question without clear explanation. MS formatting and spell checking needs attention | Provides a basic answer to each question with some explanation. MS formatting is appropriate, but spell checking needs some attention | Provides a good answer to parts of each question and some good explanations. MS formatting is appropriate, but layout and spell checking is done well | Provides a very good answer to each question with clear and reasoned explanations. MS formatting and spell checking is done well |  |
| Creation of resume for chosen scientist – individual score | A basic resume is created that has some personal details and some information relating to science achievement. Little attempt to be persuasive, or highlight qualities | A resume is created that has good personal details and some information relating to science achievement. Some attempt to be persuasive, and highlight qualities | A resume is created that has good personal details and good information relating to science achievement. A good attempt to be persuasive, and highlight some qualities | A good resume is created that has extensive personal details and information relating to science achievement. Very persuasive, highlighting all qualities |  |
| PowerPoint presentation – team score | Three scientists treated unevenly. Achievements listed without detail and expected role is not clarified.Team slide lacks persuasive quality | Three scientists treated evenly. Achievements quite detailed and expected role is partially clarified.Team slide has some persuasive quality | Three scientists treated evenly. Achievements detailed and expected role is well clarified. Team slide has a persuasive quality | Three scientists treated evenly. Achievements very detailed and expected role is well clarified. Team slide has a persuasive quality |  |
| Individual oral presentation | Speaks hesitatingly, mispronounces terms and reads notes that duplicate slides. Minimal eye contact and quite nervous. Timing not rehearsed. | Speaks clearly but mispronounces some terms and reads notes that provide new information. Occasional eye contact. Timing good | Speaks well pronounces terms correctly and uses some notes to provide new information Some eye contact Timing good | Speaks well pronounces terms correctly and does not use notes to provide new information. Good eye contact Timing good |  |
| Team oral performance | Description of identifiable performance characteristics reflecting a beginning level of performance. | Description of identifiable performance characteristics reflecting development and movement toward mastery of performance. | Description of identifiable performance characteristics reflecting mastery of performance. | Description of identifiable performance characteristics reflecting the highest level of performance. |  |

**Conclusion**

Now that you have finished this webquest, you will;

* Know what Science is and why the study of Science is important.
* Know what makes a good scientist and who are considered to be examples of some of the world’s best.
* Know how to build a resume that has impact
* Have practiced your presentation and speaking skills.

If you have time, or if your teacher asks you to extend this activity, you could do so by researching the concept of climate change more fully.

Here are some links as a starting point;

[Global Warming/Climate Change Theme Page](http://www.cln.org/themes/global_warming.html)

[At School - Resources for teachers and students](http://www.greenhouse.gov.au/education/tips/school.html) (Australian Government)

[Global Climate Change Student Guide](httphttp://www.ace.mmu.ac.uk/Resources/gcc/index.html:/www.ace.mmu.ac.uk/Resources/gcc/index.html)

**Learning Standards**

**This web quest will assist Middle School (Y7-8) Science students to learn about;**

* *historical examples of how scientific knowledge has changed people’s understanding of the world*
* *areas of everyday life that have been affected by scientific developments*
* *the role of science in providing information about issues being considered and in increasing understanding of the world around them*

**and to learn how to;**

* *access information from identified secondary sources*
* *evaluate the relevance of data and information*
* *draw conclusions based on information available*

*present information to an audience to achieve a particular purpose*

**Credits & References**

The WebQuest Page, Dodge, B, San Diego University, viewed 31/3/07, <http://webquest.sdsu.edu/templates/lesson-template1.htm>

Images from Google Image, 2007, <http://images.google.com.au/imghp?hl=en&tab=wi&q=>, viewed 2nd April 2007

Original sources from;

www.chinadaily.com.cn/.../09/content\_806262.htm, Updated: 2007-02-09 21:35, <http://images.google.com.au/images?q=scientists&gbv=2&svnum=10&hl=en&sa=G>

<ebooks.starkville.lib.ms.us/00000017-0000-000> Starkville-Oktibbeha County Public Library System, <http://images.google.com.au/images?q=amazing+scientists&btnG=Search+Images&svnum=10&um=1&hl=en>

<www.historyscribe.com/s-biographies.html> <http://images.google.com.au/images?q=s-bio scientists&btnG=Search+Images&svnum =10&um=1&hl=en >